Management of Terrorist Events Involving Radioactive Material NCRP No. 138

June 18, 2003

1. Introduction

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- Purpose – "guidance for use in a large-scale disaster involving an intense and uncontrolled exposure of many people to ionizing radiation"

- Audience – "focus is on things that would be most useful for first-responders, hospitals, and specialists in radiation safety who are likely to be included in the response"

- Scope – three broad areas: defining the problem (2-5); management of the disaster (6-9); and preparation for a major radiological incident (10-12)

Each section is "stand-alone".

2. Considerations Impacting Response

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- Factors complicating decision making process:
  - Law enforcement issues
  - Public health and safety
  - Mass causalities and damage to infrastructure
  - Psychosocial impacts
  - Environmental concerns

- Functional approach to response (two functions):
  - Crisis management
  - Consequence management

2. Considerations Impacting Response

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- **Crisis management**
  - Address the **cause** of the terrorist incident
  - A law enforcement function to anticipate, prevent, and/or resolve threat or act of terrorism
  - FBI is LFA

- **Consequence management**
  - Address how the incident **affects** public health and safety and the environment
  - FEMA is LFA

3. Characteristics and Consequences

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- Two general catagories of terrorist incidents:
  - Radiological dispersion device (RDD)
    - Localized sources
    - Widely dispersed sources
  - Nuclear weapon
    - Yield – 0.01 to 10 KY
    - Effects – air blast, thermal radiation, initial/residual nuclear radiation, and ground shock
    - 50% mortality tables

4. Medical Management of Radiation Casualties

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- Basic terminology (e.g., absorbed dose, dose equivalent, acute, chronic, etc)
- Health effects – early and late
- On-site patient assessment – radiation measurements and collection of information (reproducible procedures for responders)
- Personnel decontamination
  - Two times background
- Hospital management of patients

5. Psychosocial Effects

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- Radiological terrorist event involves
  - toxic hazards (unfamiliar, invisible, open-ended threat)
  - a deliberate act (affliction caused by other human beings)
- High risk groups (children, first responders, pregnant women
- Intervene early to prevent psychosocial problems
  - Training exercises, info centers, hot-lines, counseling services, etc

6. Command and Control

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- Crisis management –
  - FBI establishes a Joint Operations Center (JOC) which supports the senior FBI official (OSC)
- Consequence management –
  - FEMA implements the Federal Response Plan
    - Terrorism Incident Annex recently added
- State and local authorities establish the Incident Command System (under control of IC)
- One individual must be in charge
- Plans are described in Appendix B

7. Public Communication

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- Establish a Joint Information Center (JIC) early
  - To coordinate and release info to the public/media
    - Instill confidence in government
    - Provide sheltering or evacuation info
    - Indicate how to request info
    - Release info to deal with unsubstantiated rumors
  - Likely co-directed by local, state and federal officials
  - Locate JIC near JOC – separate media briefing center
  - Checklist of initial JIC actions – Appendix D
  - Conflicting concerns – public info vs crime scene control, H & S concerns, assistance to terrorists
  - Appendix E – sample pre-prepared statements

8. Dose Limitations and Guidance

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- Exposure guidelines based on ICRP 60 and NCRP 116 recommendations

- **Emergency responders** - acute exposures are once-in-a-lifetime, justified to save a life, ethical with consent
- **First responders** - equipment should initially alarm at 100 mrem/hr; turn-around level is 100 rem/hr or 100 rem
- **General public** - “Triggers” are offered for sheltering, respiratory protection, KI, evacuation, relocation, etc.

9. Consequence Management Considerations

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- Defines early (plume), intermediate (freshly deposited material) and late phases of an incident (environmental contamination)
- Recognizing a radiological incident
- Equipment for first responders
- Use of predictive models (esp in early phase)
- Radiological monitoring and assessment
  - RDD – one or only a few nuclides
  - Nuclear weapon – mix of fission products (including alpha and low energy beta)

10. Planning and Critical Resources

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- Must have an advance plan
- Use emergency plans already in place - examples of TOCs from actual plans from major cities are given
- Test notification protocols
- Table of suggested instruments TBC during planning

11. Training and Qualifications for Support Personnel

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- Training must be audience-specific (HPs and general emergency responders)
- Training categories and breadth/depth of training as outlined in the US Domestic Preparedness Program is discussed
- Exercises to maintain proficiencies are discussed
  - Four types: map or tabletop (MAPEX),command post (CPX), situational training (STX), and field training (FTX)
  - Recommends 1 FTX per 2 y, others more frequently
- Examples of basic training are in Appendix H

12. R & D Needs
13. Summary

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- R & D needs include pharmacological strategies and biodosimetry
  - Need research data for FDA approval
- Simple, permanently mounted instrument for first responders should be developed with “go-no go” read out
- Need high dose/high dose rate instruments and reliable personal dosimeters
- Recommends additional psychosocial research
  - Emphasis on intervention